Patent claims

1. A voltage regulator comprising:
- an output terminal (AK) for the provision of an output voltage and connection of a load,
- an output capacitor (20) connected to the output terminal and having an equivalent series resistance (ESR),
- a converter unit (10) having supply voltage terminals for the application of a supply voltage (Vcc), an output coupled to the output terminal (AK), a feedback signal input for feeding in a feedback signal (Vfb) dependent on the output voltage, a reference signal input for feeding in a reference signal (Vref), wherein
the converter unit (10) provides an output current (Iout), the mean value of which is proportional to the difference between the reference signal (Vref) and the feedback signal (Vfb), the proportionality factor between this difference and the output current (Iout) being adjustable by means of a control signal at a control input of the converter.

2. The voltage regulator as claimed in claim 1, in which the control signal (CTRL) is selectedin such a way that the proportionality factor is proportional to the reciprocal of the equivalent series resistance (ESR) of the output capacitor.

3. The voltage regulator as claimed in claim 1 further comprising a comparator unit (TA3) which provides a differential signal (Iea) from the reference signal (Vref) and the feedback signal (Vfb).

4. The voltage regulator as claimed in claim 3, in which the converter unit has the following further features:

- a switching converter (T1, T2, L) having an inductance (L) and a switching unit (T1, T2) for the clocked connection of the inductance to the supply voltage (Vcc) according to a pulse-width-modulated signal (PS),
- a pulse width modulator (PWM), which provides the pulse-width-modulated signal (PS) according to a regulation signal (Isum) dependent on the differential signal (Iea).

5. The voltage regulator as claimed in claim 4, in which the regulation signal (Isum) is dependent on the differential signal (Iea) and a signal (I12) dependent on the output current.

6. The voltage regulator as claimed in claim 4, in which the regulation signal (Isum) is dependent on a difference between the differential signal (Iea) and the signal (I12) dependent on the output current.

7. The voltage regulator as claimed in one of claims 2 to 4, in which the pulse width modulator has a comparator unit with switching hysteresis, to which the regulation signal (Isum) is fed and which provides the pulse-width-modulated signal (PS) depending on a comparison of the regulation signal (Isum) with a first and second threshold value (TH1, TH2).

8. The voltage regulator as claimed in one of the preceding claims, in which the comparator unit (TA3) has a control input for feeding in a control signal (CTRL), which sets the gain factor.